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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,998	04/25/2006	Gary Ng	US030435US	7251

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EXAMINER	
LEACH, CRYSTAL I	

ART UNIT	PAPER NUMBER
3737	

MAIL DATE	DELIVERY MODE
09/17/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/576,998	NG, GARY	
	Examiner	Art Unit	
	CRYSTAL I. LEACH	3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/25/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The Information Disclosure Statements (IDS) submitted on April 25, 2006 is in compliance with 37 CFR 1.97 and 1.98. The references therein have been considered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-7 and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hossack et al. (6,179,780) in view of Burns et al. (US 2001/0039381).

Hossack et al. teach an ultrasonic imaging system (see abstract) comprising: a probe (12) including a single crystal transducer array exhibiting a transducer band (see fig. 1); a transmit beamformer (16) coupled to elements of the transducer array (see fig. 1) and controlled to cause the probe to transmit two or more beams during the same transmit interval in different beam directions (see col. 1, l. 41-44 and 59-60), wherein, each beam occupies a substantially different bandwidths of the transducer band (see col. 2, l. 5-6; col. 4, l. 55-62); a receive beamformer (18) coupled to process two or more receive beams (see col. 4, l. 62-64) in response to the transmitted beams during the same receive interval (see col. 3, l. 48-49; col. 4, l. 8-9), the receive beams exhibiting steering directions corresponding to those of the transmitted beams (see fig. 7); a filter coupled to the beamformer which acts to filter the receive beams (26); a signal

processor coupled to the filter and an image processor coupled to the signal processor (see col. 2, l. 18-22: the 3-D processor of D1 comprises both signal and image processors); and a display (22) coupled to the image processor (see fig. 1) which displays an image formed from components of the receive beams (see col. 3, l. 16-17). Regarding claim 2, Hossack et al. teach that the transmit beamformer further comprises a pulse encoder which acts to cause the probe to transmit differently coded transmit pulses in the different beam directions (see col. 3, l. 53-56 and fig. 1, ref. sign 24 and 26). Regarding claim 3, Hossack et al. teach that the pulse encoder comprises one of a chirp pulse encoder, a Barker code encoder, or a Golay code encoder (see col. 4, l. 14 and 31-35). Regarding claim 4, Hossack et al. teach that the filter comprises bandpass filters exhibiting passbands corresponding to the different bandwidths (see col. 4, l. 62-64). Regarding claims 5 and 6, Hossack et al. teach that the filter comprises two or more matched filters matched to the characteristics of the transmitted beams (see col. 3, l. 58-62 and col. 4, l. 18-21). Regarding claims 13 and 14, Hossack et al. teach wherein the beamformer comprises a multiline beamformer (see col. 3, l. 4-12 and fig. 5). It would be obvious to one skilled in the art to try to correct phase variations of the received signal in order to produce the best results. Utilizing a matched filter is one of a finite number of means to correct phase variations. Therefore, it would be obvious to one of ordinary skill in the art to try using a matched filter to perform this function. It would be obvious to one of ordinary skill in the art that larger frequency bands transmit to allow better axial resolution and that there is a balance for obtaining better axial

resolution or better beam separation leading to utilization of non-overlapping or partially overlapping frequency bands in order to separate the transmit beam.

Hossack et al. do not explicitly teach a single crystal transducer array.

Burns et al. teach a single crystal transducer array (see para. [0016]). Burns et al. teach matching filters (see para. [0055]).

It would be obvious to one of ordinary skill in the art to substitute the transducer taught by Hossack et al. for the single crystal transducer array taught by Burns et al., in order to achieve a predicted result of beam transmission.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hossack et al. (6,179,780) in view of Burns et al. (US 2001/0039381) and further in view of Chiao et al. (6,558,328).

The combined invention of Hossack et al. in view of Burns et al. do not explicitly teach mismatched filters.

Chiao et al. teach utilizing mismatched filters (see col. 9. l. 7-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include mismatched filters in the invention of Hossack et al. in view of Burns et al., in light of the teaching of Chiao et al., in order to improve filtering characteristics.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Miller et al. (6,221,022) teach multiple transmit scanning to increase ultrasonic frame rate; Cooley et al. (6,494,838) teach an ultrasonic diagnostic imaging with interpolated scanlines.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CRYSTAL I. LEACH whose telephone number is (571)272-5211. The examiner can normally be reached on Monday through Friday, 8 am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brian L Casler/
Supervisory Patent Examiner, Art Unit 3737

/Crystal I Leach/
Examiner, Art Unit 3737